

CLAIMS

What is claimed is:

1. A system for reducing bandwidth consumed by gathering statistical data via a half-duplex communication bus, comprising:
 - a system controller gathering statistical data via a half-duplex communication bus;
 - at least one element in the system also on the half-duplex communication bus, said element:
 - (i) in a controlled manner, automatically providing the statistical data to an information buffer in the element; and
 - (ii) reporting a subset of the statistical data in the buffer to the system controller when polled a) for the statistical data or b) for some other reason; and
 - the automatic providing and subsequent reporting of statistical data reducing the number of communications and data transfer cycles required to transfer the statistical data from the element to the system controller resulting in a reduction of bandwidth consumed by gathering the statistical data from the element via the half-duplex communication bus.
2. The system according to Claim 1 wherein the buffer is organized in a queue and the statistical data is reported whenever the element has been polled for the statistical data or for some other reason and the statistical data has reached the head of the queue.

3. The system according to Claim 1 wherein the element is a line card having at least one processor monitoring at least one communication port.
4. The system according to Claim 1 wherein the system reports the gathered statistical data to a central statistical data gathering system.
- 5 5. The system according to Claim 1 wherein:
- the statistical data includes information about an element communication port; and
- the buffer stores only one instance of information about a communication port at any given time.
- 10 6. The system according to Claim 1 wherein the element makes statistical data regarding respective ports available at least as often as the system controller requires the statistical data.
7. The system according to Claim 1 wherein the element makes the statistical data available at least one time per second.
- 15 8. The system according to Claim 1 wherein the element makes the statistical data available as often as necessary but not so often that the buffer is congested by the statistical data.
9. The system according to Claim 1 wherein the element reports statistical data in place of reporting a null response.
- 20 10. A method for reducing the bandwidth consumed by gathering statistical data on a half-duplex communication bus, comprising:

gathering statistical data from at least one element in a multiprocessor system employing the half-duplex bus;

automatically providing statistical data to a system controller in a controlled manner; and

reporting the statistical data to the system controller when polled either for the statistical data or for some other reason;

the automatic buffering and subsequent reporting reducing the number of communications and data transfer cycles required to transfer the statistical data from the element to the system controller resulting in a reduction of bandwidth consumed by gathering the statistical data about the elements via the half-duplex communication bus.

11. The method according to Claim 10 wherein the element further comprises:

organizing the data in the buffer in a queue; and

reporting the statistical data whenever the element has been polled for the statistical data or for some other reason and the statistical data has reached the head of the queue.

12. The method according to Claim 10 wherein the element is a line card having at least one processor monitoring at least one communication port in the line card.

13. The method according to Claim 10 further comprising reporting to a central statistical data gathering system the statistical data gathered from the elements.

14. The method according to Claim 10 wherein:

the statistical data refers to an element communication port; and

the buffer stores only one instance about an element communication port at any given time.

15. The method according to Claim 10 wherein automatically providing statistical data is performed at least as often as the statistical data is gathered by the system controller.
16. The method according to Claim 10 wherein automatically providing statistical data is performed at least one time per second.
17. The method according to Claim 10 wherein automatically providing statistical data is performed as often as necessary but not so often that the buffer is congested by the statistical data.
18. The method according to Claim 10 wherein reporting the statistical data is performed in place of reporting a null response.
19. A system for reducing the bandwidth consumed by gathering statistical data via a half-duplex communication bus, comprising:
- means for gathering statistical data from at least one element in the system employing a half-duplex communication bus;
 - means for automatically providing statistical data to said means for gathering statistical data in a controlled manner in a buffer; and
 - means for reporting the statistical data to said means for gathering the statistical data when polled either for the statistical data or for some other reason and the statistical data is selected to be reported;
 - said means for automatically providing and said means for reporting reducing the number of communications and data transfer cycles required to transfer the statistical data from the element to the means for gathering the statistical data resulting in a reduction of bandwidth consumed by gathering the statistical data about the elements via the half-duplex communication bus.

20. An apparatus for reducing the bandwidth consumed by gathering statistical data on a half-duplex communication bus, comprising:
 - at least one communication port having high-speed communication capabilities with external devices;
 - a processor coupled to the communication port, the processor maintaining statistical data about the communication port;
 - a buffer coupled to the processor, the processor automatically polling the buffer, in a controlled manner, statistical data to a system controller;
 - an interface transmitting the statistical data to the system controller, the interface being polled either for the statistical data or for some other reason and the statistical data is selected to be reported.
21. The apparatus according to Claim 20 wherein the statistical data is organized in a queue.
22. The apparatus according to Claim 20 wherein the processor limits the number of data in the buffer to one entry per port at any given time.
23. The apparatus according to Claim 20 wherein the processor polls for statistical data about a port at about the rate of being requested by the system controller.
24. The apparatus according to Claim 20 wherein the processor polls for statistical data about a port as often as necessary but not so often that the buffer is overflowed with statistical data.
25. The apparatus according to Claim 20 wherein the statistical data is reported in place of reporting a null.

26. In a line card having at least one communication port, a method for reducing the bandwidth consumed by gathering statistical data on a half-duplex communication bus, comprising:
- 5 maintaining statistical data about at least one communication port;
 automatically writing the statistical data to a buffer;
 transmitting the statistical data to a system controller when polled either for the statistical data or for some other reason and the statistical data is selected to be reported.
- 10 27. The method according to Claim 26 wherein the statistical data in the buffer is organized in a queue.
28. The method according to Claim 26 wherein writing the statistical data to the buffer limits the number of entries per port in the buffer.
29. The method according to Claim 26 wherein writing the statistical data to the buffer occurs at about the rate of requests for data about an individual port.
- 15 30. The method according to Claim 26 wherein writing the statistical data to the buffer occurs as often as necessary but not so often that the buffer is congested by the statistical data.
31. The method according to Claim 26 wherein transmitting the statistical data occurs in place of transmitting a null response message.
- 20 32. An apparatus for reducing the bandwidth consumed by gathering statistical data on a half-duplex communication bus, comprising:
 means for supporting high-speed communications with external devices;

means for automatically reporting the statistical data to a requesting device when polled for the statistical data or for some other reason and the statistical data is selected to be reported.

- 5 statistical data is selected to be reported.
33. A computer program product, comprising:
- a computer usable medium for storing data;
 - a set of computer program instructions embodied on the computer usable medium, including instructions to:
- 10 maintain statistical data about at least one communication port;
- automatically write the statistical data to a buffer;
 - transmit the statistical data to a system controller when polled either for the statistical data or for some other reason and the statistical data is selected to be reported.
- 15 34. The computer program product according to Claim 33 wherein the instructions further include instructions to organize the statistical data in the buffer in a queue.
35. The computer program product according to Claim 33 wherein the instructions further include instructions to limit the statistical data in the buffer.
- 20 36. The computer program product according to Claim 33 wherein the instructions further include instructions to make the statistical data available at about the rate of being requested by the system controller.

37. The computer program product according to Claim 33 wherein the instructions further include instructions to make the statistical data available in the buffer as often as necessary but not so often that the buffer is congested by the statistical data.
- 5 38. The computer program product according to Claim 33 wherein the instructions further include instructions to report a subset of the statistical data in place of reporting a null.
39. A system for reducing bandwidth consumed by gathering data via a communication bus, comprising:
- 10 a system controller gathering data on a communication bus;
at least one element in the system also on the communication bus, said element:
- (i) providing the data to a buffer; and
- (ii) reporting a subset of the data in the buffer to the system
- 15 controller when polled a) for the data or b) for some other reason.
40. A method for reducing bandwidth consumed by gathering data via a communication bus, comprising:
- gathering substantive data in a buffer;
- when polled a) for the data or b) for some other reason, reporting the
- 20 substantive data from the buffer instead of non-substantive data.

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